

A Revisional Study of the Japanese Salticid
Spiders of the Genus *Neon* SIMON
(Araneae: Salticidae)

Hiroyoshi IKEDA¹⁾

池田博明¹⁾: 日本産ネオンハエトリグモ属 (クモ目:
ハエトリグモ科) の分類学的研究

Abstract Japanese salticid spiders of the genus *Neon* SIMON, 1876, are revised. After an examination of many specimens from Japan, five species of the genus were recognized, that is, *Neon reticulatus* (BLACKWALL, 1853), *N. kiyotoi* sp. nov., *N. nojimai* sp. nov., *N. minutus* ZABKA, 1985, and *N. ningyo* sp. nov. All the species are described and illustrated.

Up to the present, 17 species of salticid spiders of the genus *Neon* were described from the World (ROEWER, 1954; BRIGNOLI, 1983; PLATNICK, 1988). Of these *Neon nigriceps* BRYANT, 1940 was considered as a member of the other genus (BRYANT, 1940; GERTSCH & IVIE, 1955).

From Japan, *Neon reticulatus* (BLACKWALL, 1853) has been the only known species of the genus *Neon* (YAGINUMA, 1986). However, Mr. Kiyoto OGATA collected many specimens of the genus *Neon* in Aichi Prefecture and recognized several species among these specimens. Mr. Ko-ichi NOJIMA also discovered unknown species of the genus *Neon* in various places of Okayama Prefecture. I examined their specimens and other specimens newly obtained from Japan, and then consequently identified them into five species, that is, *Neon reticulatus* (BLACKWALL, 1853), *N. kiyotoi* sp. nov., *N. nojimai* sp. nov., *Neon minutus* ZABKA 1985, and *N. ningyo* sp. nov.

These species are easily distinguishable from one another by the condition of the first leg of the male as shown in Table 11 and in Figs. 45–49.

The type specimens and a part of other specimens used in this paper are deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo.

The following abbreviations are used: ALE, anterior lateral eye; AME, anterior median eye; PLE, posterior lateral eye; PME, posterior median eye. The distances between eyes are presented with a dash, e.g., ALE–ALE indicates distance between ALEs.

1) Kanade 1099, Oimachi, Ashigarakami-gun, Kanagawa, 258 Japan

〒258 神奈川県足柄上郡大井町金手 1099

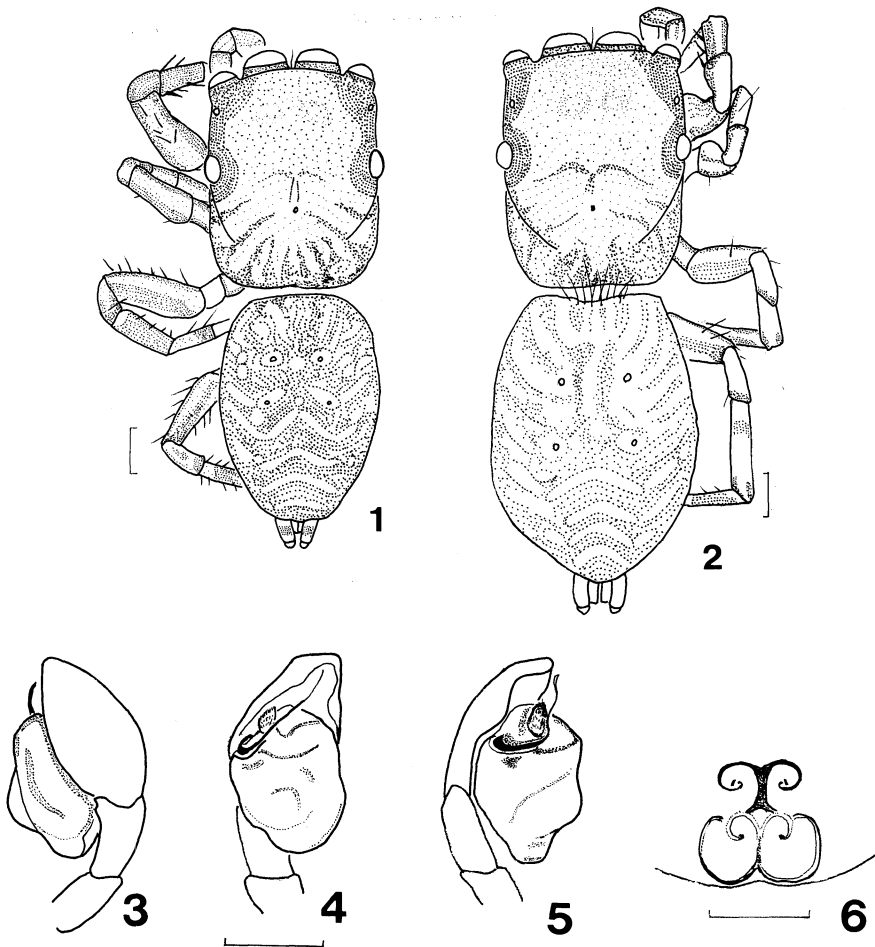
Accepted June 14, 1995

Genus *Neon* SIMON, 1876*Neon reticulatus* (BLACKWALL, 1853)

(Figs. 1-6, 18-19, 47)

Salticus reticulatus BLACKWALL, 1853, p. 14; 1861, pp. 60-61, fig. 33.

Neon reticulatus: SIMON, 1937, pp. 1183-1184, figs. 1863-1865. — TULLGREN, 1945, p. 130, figs. 38A, 39A-B. — LOCKET & MILLIDGE, 1954, p. 221, figs. 109c, f. — GERTSCH & IVIE, 1955, pp. 8-11, figs. 12-14. — JONES, 1983, pp. 146-147. — SHINKAI & TAKANO, 1984, p. 158. — ROBERTS, 1985, p. 122, pl. 60, fig. 50 (a). — YAGINUMA, 1986, p. 242, pl. 64 (4), fig. 6. — CHIKUNI, 1989, p. 287, fig. 59 (159). — HEIMER & NENTWIG, 1991, pp. 510-513, figs. 1365. 1-4.



Figs. 1-6. *Neon reticulatus* (BLACKWALL, 1853). — 1, Male, dorsal view; 2, female, dorsal view; 3, male palp, dorsal view; 4, same, ventral view; 5, same, prolateral view; 6, epigynum. (Scales: 0.2 mm.)

Specimens examined. 1♀, Izu-numa, Tome-gun, Miyagi Pref., Japan, 11-II-1989, A. TANIKAWA leg. (NSMT-Ar 3207); 1♀, Sirakawa-no-seki-ato, Fukushima Pref., 24-VI-1990, A. TANIKAWA leg. (NSMT-Ar 3208); 1♂, Ohwakudani, Hakone-machi, Kanagawa Pref., 28-V-1989, T. ISHIHARA leg. (NSMT-Ar 3209); 2♂2♀, Inabu, Kitashitara-gun, Aichi Pref., 12-VI-1993, K. OGATA leg. (NSMT-Ar 3210); 1♂, Nagi-san, Nagi-machi, Okayama Pref., 23-V-1993, K. NOJIMA leg. (NSMT-Ar 3211).

Description. Measurement (in mm) [mean, ♂ N=4, ♀ N=4]. Body length ♂ 1.80–2.44 [2.10], ♀ 2.30–3.34 [2.60]; prosoma length ♂ 0.93–1.14 [1.01], ♀ 0.99–1.26 [1.10], width ♂ 0.74–0.96 [0.81], ♀ 0.78–1.04 [0.88], height ♂ 0.54–0.74 [0.64], ♀ 0.59–0.74 [0.65]; opisthosoma length ♂ 0.94–1.20 [1.07], ♀ 1.25–1.71 [1.38], width ♂ 0.74–0.99 [0.81], ♀ 0.90–1.46 [1.06].

Eye fields: ALE-ALE ♂ 0.72–0.91 [0.79], ♀ 0.82–1.00 [0.89], PLE-PLE ♂ 0.74–0.94 [0.81], ♀ 0.83–0.96 [0.88], ALE-PLE ♂ 0.50–0.64 [0.56], ♀ 0.56–0.68 [0.61], ALE-PME ♂ 0.26–0.34 [0.29], ♀ 0.29–0.35 [0.32], AME diameter ♂ 0.24–0.28 [0.25], ♀ 0.26–0.34 [0.29]; ratio ALE/AME ♂ 0.57–0.69 [0.65], ♀ 0.56–0.63 [0.61], ALE/PLE ♂ 1.06–1.50 [1.27], ♀ 1.11–1.25 [1.15], PME/PLE ♂ 0.23–0.25 [0.24], ♀ 0.23–0.28 [0.26].

Legs. Length of legs of 1♂ (NSMT-Ar 3210; prosoma width 0.74 mm) and 1♀ (NSMT-Ar 3210; prosoma width 0.78 mm) as shown in Table 1. Spiniformation of legs of the same specimens as shown in Table 2.

Male palp (Figs. 3–5, 18–19). Embolus a thin spine passing across apical edge to cymbial groove. Conspicuous spiculate lobe present in inner side of embolus, slightly distant from the base. Tibial apophysis as shown in Fig. 19.

Epigynum (Fig. 6). Epigynum consisting of two suboval atria separated by a

Table 1. Measurement of leg segments of *Neon reticulatus* (in mm; ♂/♀).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	0.59/0.58	0.29/0.32	0.45/0.45	0.27/0.29	0.24/0.22	1.84/1.86
II	0.48/0.48	0.27/0.27	0.35/0.35	0.24/0.24	0.21/0.21	1.55/1.55
III	0.50/0.54	0.26/0.26	0.32/0.32	0.29/0.32	0.26/0.26	1.63/1.70
VI	0.61/0.64	0.24/0.30	0.35/0.46	0.42/0.43	0.30/0.32	2.02/2.15

Table 2. Spiniformation of legs of *Neon reticulatus* (r=retrolateral, p=prolateral, none=no spine). [No spine on other segments.]

Leg		Tibia	Metatarsus ventral	Tibia	Metatarsus dorsolateral
I	♂	2-2-2-0	2-2	none	none
	♀	2-2-2-0	2-2	none	none
II	♂	1r-1r-0	1r-1r	none	none
	♀	1-1-0	2-2	none	none
III	♂	none	0-2	none	none
	♀	none	0-2	none	none

thin median septum. Voluminous spermatheca wider than the atria and clearly visible through the integument.

Coloration and markings (Figs. 1–2, 47). Male: Prosoma dark brown with marginal black hairs, surroundings of eyes black with white hairs. Clypeus dark brown with several hairs. Sternum dark brown. Labium, maxillae and chelicerae dark brown with light margins. Opisthosomal dorsum yellowish white, reticulated with black, and covered with white hairs and marginal black hairs. Venter of opisthosoma black covered with short hairs. Legs I and IV: Femora, patellae, tibiae and metatarsi dark brown, tarsi yellowish white. Legs II and III: Femora dark brown, tarsi yellowish white, remaining parts of legs yellowish white with dark distal ends. Anterior parts of prosoma and legs sheeny.

Female: Prosoma yellow brown with marginal black hairs, surroundings of eyes black, with white hairs. Clypeus brown with several brown hairs. Sternum, labium, maxillae and chelicerae yellow-brown each edge paler. Opisthosomal dorsum yellowish white reticulated with black, with black hairs, and many black setae in anterior part. Venter of opisthosoma yellowish white, reticulated with black, covered with short hairs. Legs I: Lateral surface of femora, patellae, tibiae dark brown, remaining parts yellow-brown. Legs II–IV: yellow-brown, with dark brown distal ends. Anterior parts of prosoma and legs slightly sheeny.

Distribution. Japan (Hokkaido, Honshu); Holarctic areas.

Remarks. *Neon reticulatus* resembles *Neon robustus* LOHMENDER, 1945, but can be distinguished from the latter by the position of spiculate lobe, the shape of the embolus of male palp, and the relative size of oval atria and spermathecae of the female genitalia (TULLGREN, 1945; HEIMER & NENTWIG, 1990).

Neon kiyotoi sp. nov.

(Figs. 7–17, 48)

Type series. Holotype: ♂, Horaiji-san, Horai-machi, Minamishitara-gun, Aichi Pref., 29–VI–1991, K. OGATA Leg. (NSMT–Ar 3212). Allotype: ♀, same data as for the holotype. (NSMT–Ar 3213). Paratypes: 1♂, same locality and collector as for the holotype, 6–XII–1992. (NSMT–Ar 3214); 1♀, same locality and collector as for the holotype, 6–XI–1992. (NSMT–Ar 3215).

Description. Measurement of holotype and allotype (in mm) [mean, ♂ N=3, ♀ N=2]. Body length ♂ 2.04 [2.14], ♀ 2.80 [2.52]; prosoma length ♂ 1.17 [1.14], ♀ 1.12 [1.12], width ♂ 0.94 [0.92], ♀ 0.94 [0.94], height ♂ 0.73 [0.67], ♀ 0.64 [0.64]; opisthosoma length ♂ 0.96 [0.96], ♀ 1.33 [1.25], width ♂ 0.83 [0.86], ♀ 1.14 [0.97].

Eye fields: ALE–ALE ♂ 1.00 [0.95], ♀ 0.99 [0.98], PLE–PLE ♂ 0.99 [0.94], ♀ 0.96 [0.97], ALE–PLE ♂ 0.61 [0.59], ♀ 0.59 [0.60], ALE–PME ♂ 0.40 [0.36], ♀ 0.38 [0.37], AME diameter ♂ 0.32 [0.31], ♀ 0.29 [0.31]; ratio ALE/AME ♂ 0.60, ♀ 0.67, ALE/PLE ♂ 1.00, ♀ 1.09, PME/PLE ♂ 0.21, ♀ 0.23.

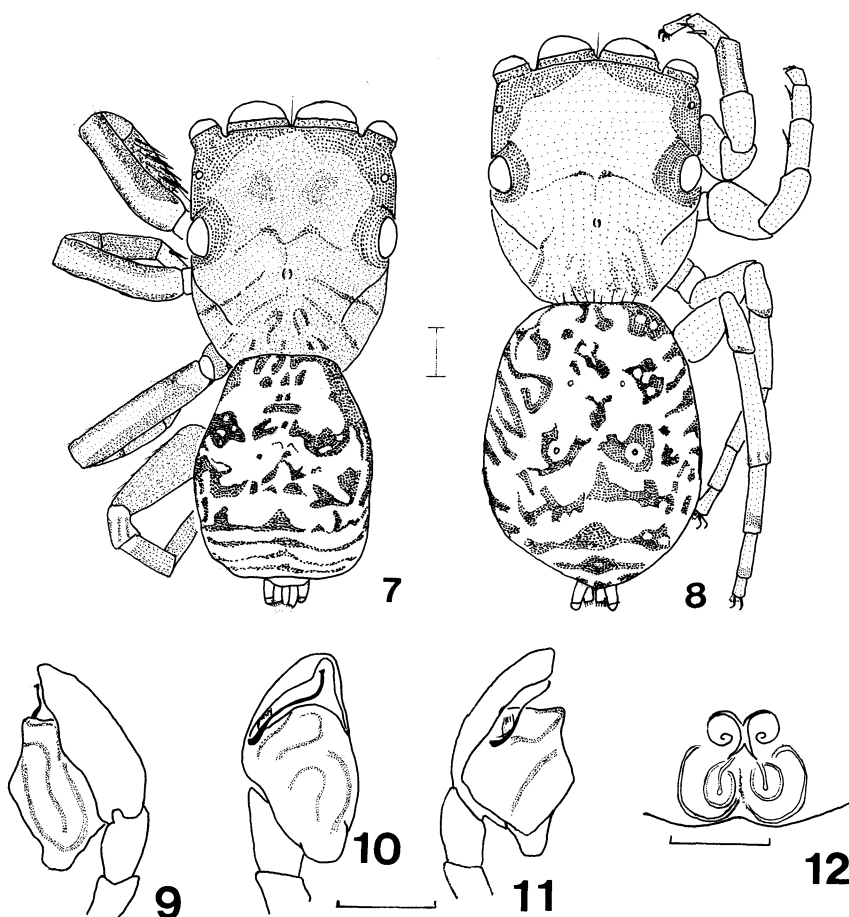
Legs. Length of legs of the holotype ♂ and paratype ♀ as shown in Table 3. Spiniformation of legs of the same specimens as shown in Table 4.

Male palp (Figs. 9–11, 13–15). Embolus a thin spine passing across apical edge to cymbial groove, apical end of embolus Y-shaped (Fig. 14). Small spiculate lobe present from inner side of embolus near the base.

Female genitalia (Figs. 12, 16–17). Epigynum consisting of two round atria

separated by a thin median septum. Outer spermatheca wider than the atria, inner spermatheca equal in size to the atria.

Coloration and markings (Figs. 7–8, 48). Male: Prosoma dark brown with white hairs, margined with black hairs, surroundings of eyes black with white hairs.



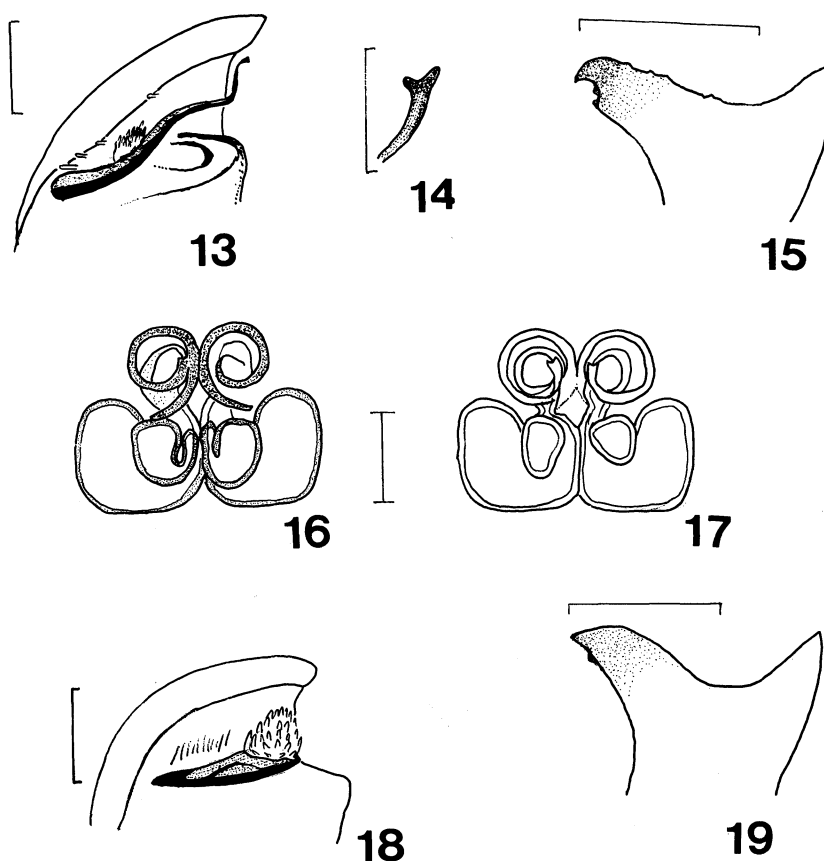
Figs. 7–12. *Neon kiyotoi* sp. nov.—7, Male, dorsal view; 8, female, dorsal view; 9, male palp, dorsal view; 10, same, ventral view; 11, same, prolateral view; 12, epigynum. (Scales: 0.2 mm.)

Table 3. Measurement of leg segments of *Neon kiyotoi* sp. nov. (in mm; ♂/♀).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	0.72/0.68	0.34/0.40	0.50/0.48	0.30/0.29	0.24/0.21	2.10/2.06
II	0.61/0.56	0.27/0.32	0.40/0.38	0.30/0.27	0.24/0.24	1.82/1.77
III	0.68/0.66	0.32/0.32	0.38/0.36	0.36/0.37	0.20/0.24	1.94/1.95
IV	0.76/0.72	0.29/0.32	0.45/0.51	0.48/0.48	0.26/0.32	2.24/2.35

Table 4. Spiniformation of legs of *Neon kiyotoi* sp. nov. (r=retrolateral, p=prolateral, none=no spine). [No spine on other segments.]

Leg		Tibia	Metatarsus	Tibia	Metatarsus
			ventral	dorsolateral	dorsolateral
I	♂	2-2-2-0	2-2	none	none
	♀	2-2-2-0	2-2	none	none
II	♂	1-2-0	2-2	none	none
	♀	1r-2-0	2-2	none	none
III	♂	none	1r-2	0-2-0	0-1p
	♀	none	1r-2	0-1p-0	0-2-0



Figs. 13-19. 13-17, *Neon kiyotoi* sp. nov.; 18-19, *Neon reticulatus* (BLACKWALL, 1853).—
13, 18, Male palp, basal part of embolus; 14, apical part of embolus, ventral view; 15,
19, tibial apophysis of male palp; 16, female genitalia, ventral view; 17, same, dorsal
view. (Scales: 0.1 mm.)

Clypeus dark brown with brown and white hairs. Sternum dark brown. Labium, maxillae and chelicerae dark brown with light margins. Opisthosomal dorsum yellowish white with black spots, and covered with white hairs and marginal black hairs. Venter of opisthosoma black and covered with short black hairs. Legs I and II: Femora, patellae and tibiae dark brown with dorsal margin, metatarsi and tarsi yellow brown, each distal end dark. Legs III and IV: Femora, patellae, and tibiae dark brown with dorsal margin, metatarsi dark brown, tarsi yellow brown, each distal end dark. Prosoma and legs sheeny, especially blackish part with metallic luster.

Female: Prosoma yellow brown with white and black hairs and with marginal black hairs, surroundings of eyes black with white hairs. Clypeus brown with brown and white hairs. Sternum yellow brown with dark margins, labium, maxillae and chelicerae yellow-brown with short black hairs, each edge paler. Opisthosomal dorsum yellowish white with black spots, with black hairs, and many black anterior setae. Venter of opisthosoma yellowish white reticulated with black and with short black and white hairs. Legs I: Lateral surface of femora, patellae, tibiae, distal ends of metatarsi dark brown, remaining parts yellow-brown. Legs II–IV: yellow-brown with dark brown distal ends, tarsi yellow-brown. Prosoma and legs sheeny.

Distribution. Japan (known only from the type locality).

Remarks. *Neon kiyotoi* closely resembles *N. robustus* LOHMANDER, 1945, but can be distinguished from the latter by the copulatory organ (TULLGREN, 1945; HEIMER & NENTWIG, 1990). In the male palp of *N. kiyotoi*, the space between the cymbium and the bulb narrower than that of *N. robustus*. The spermatheca of *N. kiyotoi* has three bursae (Fig. 16). The male of *N. kiyotoi* can be easily distinguished from the males of *N. reticulatus* and *N. nojimai* sp. nov., by the hairs of prosoma and the setae of the first leg (Figs. 47–49).

Etymology. The specific name is dedicated to Mr. Kiyoto OGATA, Aichi Pref.

Neon nojimai sp. nov.

(Figs. 18–22, 49)

Holotype: ♂, Yorishima-machi, Asakuchi-gun, Okayama Pref., Japan, 16–V–1993, K. NOJIMA leg. (NSMT–Ar 3216).

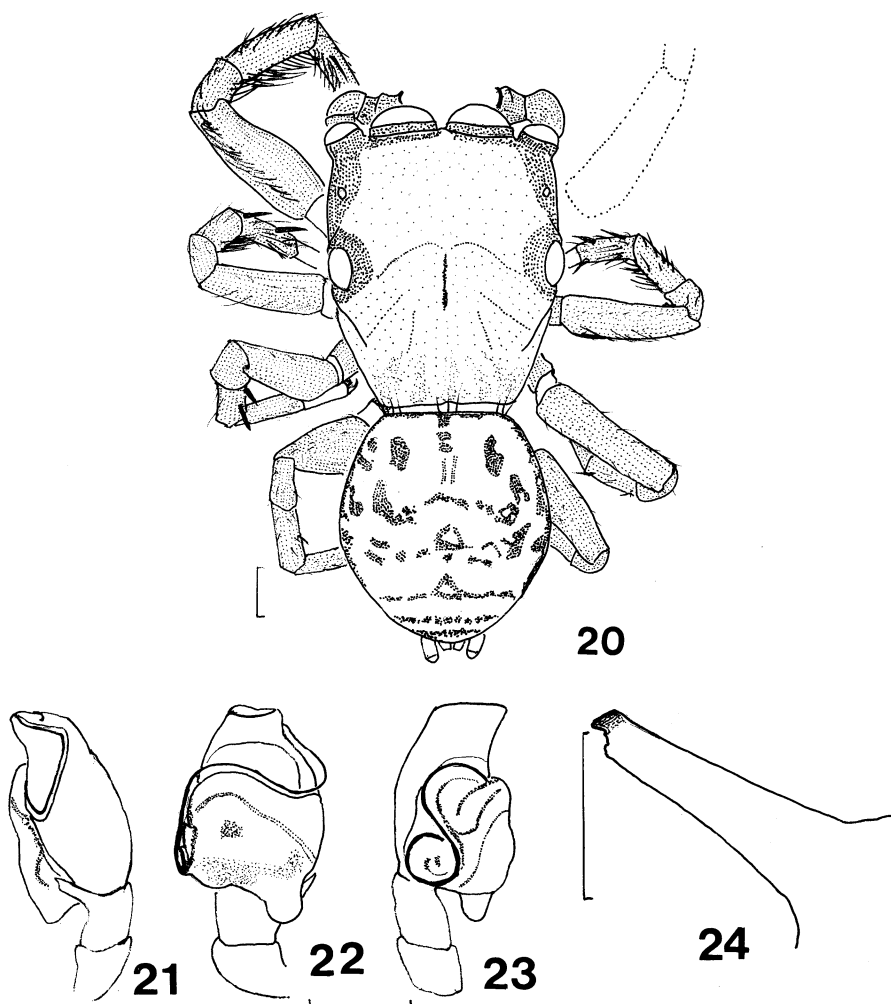
Description. Measurement of holotype (in mm). Body length 2.07; prosoma length 1.12, width 0.98, height 0.72; opisthosoma length 0.96, width 0.86.

Eye fields: ALE–ALE 0.98, PLE–PLE 1.04, ALE–PLE 0.67, ALE–PME 0.32, AME diameter 0.29; ratio ALE/AME 0.67, ALE/PLE 1.20, PME/PLE 0.25.

Legs. Length of legs of the holotype ♂ as shown in Table 5. Spiniformation of legs of the same specimen as shown in Table 6.

Male palp (Figs. 21–24). Embolus twice spiraled at base and at apex. Tibial apophysis long, truncated (Fig. 24).

Coloration and markings (Figs. 20, 49). Male: Prosoma yellow-brown with white hairs, with marginal black hairs, surroundings of eyes black with white hairs. Sternum brown with dark margin. Clypeus brown, hairless. Labium, maxillae and chelicerae dark brown, with white margins, respectively. Opisthosomal dorsum yellowish white with black spots, covered with white hairs, with anterior black setae



Figs. 20–24. *Neon nojimai* sp. nov.—20, Male, dorsal view; 21, male palp, dorsal view; 22, same, ventral view; 23, same, prolateral view; 24, tibial apophysis of male palp. (Scales: 20–23, 0.2 mm, 24, 0.1 mm.)

Table 5. Measurement of leg segments of *Neon nojimai* sp. nov. (in mm; ♂).

Feg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	0.83	0.38	0.60	0.35	0.24	2.40
II	0.65	0.30	0.40	0.29	0.24	1.88
III	0.74	0.32	0.40	0.36	0.24	2.06
IV	0.72	0.29	0.46	0.46	0.24	2.17

Table 6. Spiniformation of legs of the male of *Neon nojimai* sp. nov. (r=retrolateral, p=prolateral, none=no spine). [No spine on other segments.]

Leg	Tibia	Metatarsus	Tibia	Metatarsus
		ventral		dorsolateral
I	2-2-2-0	2-2	none	none
II	1-1r-0	2-2	none	none
III	0-0-1r	2-0	0-2-0	2-0-1r
IV	0-1-1	none	0-1p-0	1r-2

and marginal black hairs. Venter of opisthosoma black and covered with short black hairs. Legs I: Femora, patellae, tibiae and metatarsi dark brown, tarsi yellowish white, with black and white hairs; rows of scale-like black setae present on dorsal surface of femora, on ventral surface of patellae and metatarsi, on ventral and dorsal surface of tibiae. Legs II: Femora, patellae, tibiae dark brown, metatarsi brown annulated with dark brown, tarsi yellow-brown with black and white hairs; rows of scale-like black setae present on dorsal surface of femora, ventral surface of patellae, tibiae and metatarsi. Legs III and IV: Femora dark brown, distal ends of patellae, proximal and distal ends of tibiae and metatarsi brown, remaining parts of legs yellow-brown. Prosoma and legs sheeny, especially blackish part with metallic luster.

Female: Unknown.

Distribution. Japan (known only from the type locality).

Remarks. *Neon nojimai* resembles *N. kiyotoi* sp. nov., but can be distinguished from the latter by the structure of male palp and the spiniformation of legs (Figs. 48-49).

Etymology. The specific name is dedicated to Mr. Ko-ichi NOJIMA, Okayama Pref.

Neon minutus ŽABKA, 1985

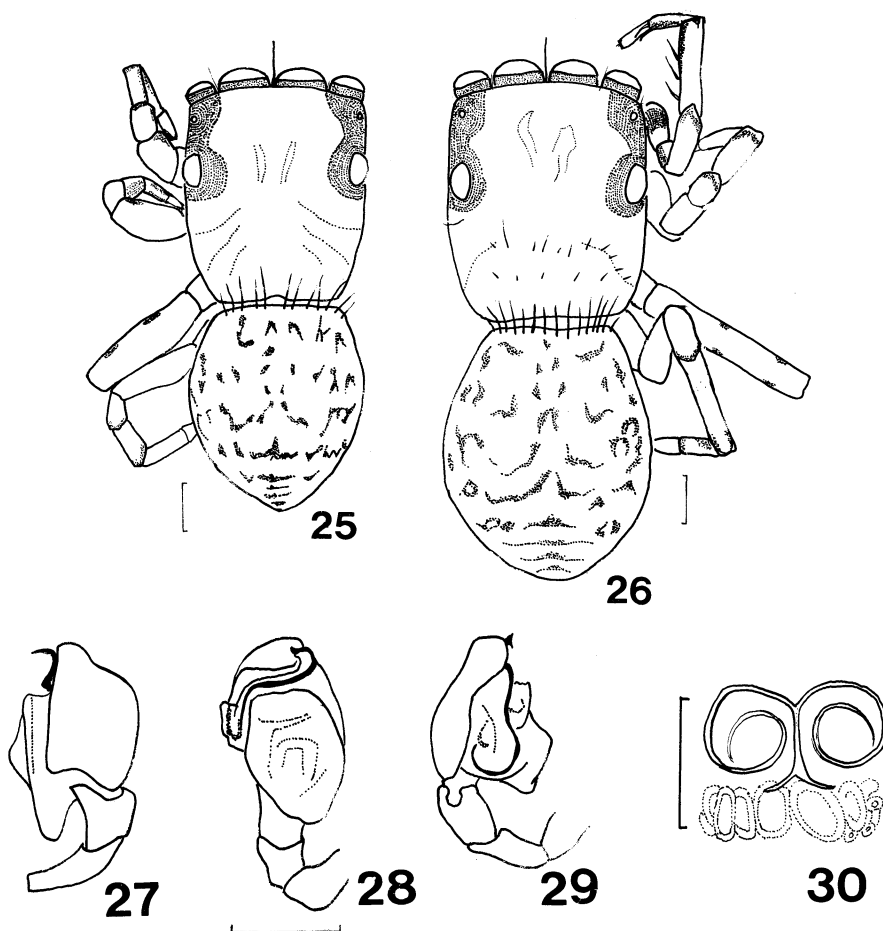
(Figs. 25-33, 45)

Neon minutus ŽABKA, 1985: 420, figs. 372-377.

Specimens examined. 1♀, Jataki-guchi, Mt. Takao, Hachioji-shi, Tokyo, 7-V-1991, K. KUMADA leg.; 2♀, Ajiro, Itsukaichi-shi, Tokyo, 11-V-1991, K. KUMADA leg.; 1♀, Kaminagabuchi, Ohme-shi, Tokyo, 1-XI-1990, K. KUMADA leg.; 1♀, Hachioji-joshi, Hachioji-shi, Tokyo, 17-V-1991, K. KUMADA leg.; 1♀, Taura, Yokosuka-shi, Kanagawa Pref., 18-III-1978, K. KUMADA leg. (NSMT-Ar 3217); 1♂ 3♀, Seto-shi, Aichi Pref., 13-X-1991, K. OGATA leg. (NSMT-Ar 3218); 1♂, 4♀, Seto-shi, Aichi Pref., 23-XII-1992, K. OGATA leg. (NSMT-Ar 3219); 1♂5♀, Rokusho-san, Toyoda-shi, Aichi Pref., 3-X-1990, K. OGATA leg. (NSMT-Ar 3220); 1♂2♀, Kanpachi-kyo, Toyoda-shi, Aichi Pref., 7-XII-1990, K. OGATA leg.; 11♀, Unkoh-temple, Seto-shi, Aichi Pref., 14-V-1991, K. OGATA leg.; 4♀, Unkoh-temple, Setoshi, Aichi Pref., 20-III-1992, K. OGATA leg.; 4♀, Hasso, Imai-machi, Inuyama-shi, Aichi Pref., 17-XI-1991, K. OGATA leg.; 3♀, Fujii-machi, Okazaki-

shi, Aichi Pref., 26-XI-1991, K. OGATA leg.; 4♀, Uchiumi, Chita-machi, Aichi Pref., 10-II-1992, K. OGATA leg.; 3♀, Hamasaka-shrine, Hamasaka, Tottori Pref., 20-XII-1991, N. TSURUSAKI leg.; 1♀, Taga, Saeki-machi, Wake-gun, Okayama Pref., 24-IV-1994, K. NOJIMA leg.; 1♂, Tamashima Kurosaki, Kurashiki-shi, Okayama Pref., 22-VIII-1993, K. NOJIMA leg.; 1♀, Kawamatsu, Hatsukaichi-shi, Hiroshima Pref., 18-VII-1992, Y. IHARA leg.; 1♀, Taketatsu-shrine, Kunisaki, Oita Pref., 7-XII-1991, S. NOMURA & T. NAKAMURA leg.

Description. Measurement (in mm) [mean, ♂ N=4, ♀ N=6 (NSMT-Ar 3217-3220)]. Body length ♂ 1.69-1.86 [1.78], ♀ 1.67-2.05 [1.88]; prosoma length ♂ 0.80-0.88 [0.84], ♀ 0.77-0.96 [0.88], width ♂ 0.70-0.72 [0.72], ♀ 0.77-0.88 [0.80], height ♂ 0.51-0.55 [0.53], ♀ 0.50-0.64 [0.57]; opisthosoma length ♂ 0.75-0.85 [0.82], ♀ 0.86-1.09 [0.96], width ♂ 0.66-0.74 [0.71], ♀ 0.72-0.96 [0.83].



Figs. 25-30. *Neon minutus* ŽABKA, 1985.—25, Male, dorsal view; 26, female, dorsal view; 27, male palp, dorsal view; 28, same, ventral view; 29, same, prolateral view; 30, epigynum. (Scales: 0.2 mm.)

Eye fields: ALE-ALE ♂ 0.67–0.72 [0.70], ♀ 0.72–0.84 [0.77], PLE-PLE ♂ 0.70–0.77 [0.73], ♀ 0.77–0.88 [0.81], ALE-PLE ♂ 0.45–0.54 [0.50], ♀ 0.51–0.58 [0.55], ALE-PME ♂ 0.22–0.26 [0.24], ♀ 0.22–0.28 [0.25], AME diameter ♂ 0.21–0.22 [0.22], ♀ 0.22–0.29 [0.25]; ratio ALE/AME ♂ 0.55–0.70 [0.61], ♀ 0.57–0.67 [0.66], ALE/PLE ♂ 1.03–1.17 [1.10], ♀ 1.07–1.18 [1.11], PME/PLE ♂ 0.25–0.27 [0.26], ♀ 0.20–0.27 [0.23].

Legs. Length of legs of 1♂ (NSMT-Ar 3218; prosoma width 0.72 mm) and 1♀ (NSMT-Ar 3217; prosoma width 0.78 mm) as shown in Table 7. Spiniformation of legs of the same specimens as shown in Table 8.

Male palp (Figs. 27–29, 31). Embolus originating laterally, long band-like, apically twisted and with membrane.

Female genitalia (Figs. 30, 32–33). Epigynum orange, consisting of two round atria separated by a thin median septum. Seminal ducts complicated canals twisted into several loops.

Coloration and markings (Figs. 25–26, 45). Male: Prosoma whitish grey with white hairs, surroundings of eyes black with white hairs. Clypeus blackish with several brown and white hairs. Sternum, labium, maxillae and chelicerae whitish grey. Opisthosomal dorsum white with black spots, sparse black hairs, several anterior black setae and marginal white hairs. Venter of opisthosoma white with marginal white hairs. Legs I: Proximal and distal ends of femora, distal ends and prolateral surface of patellae, tibiae and metatarsi black, remaining parts of the legs white; legs II–IV: white with distal black ends except for tarsi, tarsi white. Prosoma slightly sheeny.

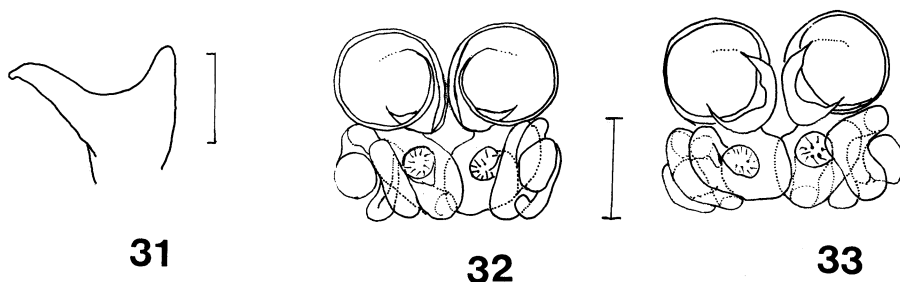
Female: As in male, but opisthosomal dorsum with black hairs and many anterior black setae. Prosoma and legs slightly sheeny.

Table 7. Measurement of leg segments of *Neon minutus* (in mm; ♂/♀).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	0.51/0.52	0.21/0.26	0.40/0.45	0.24/0.26	0.22/0.19	1.58/1.68
II	0.42/0.46	0.21/0.22	0.32/0.32	0.20/0.26	0.22/0.19	1.37/1.45
III	0.50/0.50	0.21/0.24	0.32/0.34	0.28/0.32	0.26/0.21	1.57/1.61
IV	0.56/0.54	0.21/0.24	0.38/0.38	0.37/0.40	0.26/0.29	1.78/1.85

Table 8. Spiniformation of legs of *Neon minutus* (r=retrolateral, p=prolateral, none=no spine.) [No spine on other segments.]

Leg		Tibia	Metatarsus ventral	Tibia	Metatarsus dorsolateral
I	♂	2–2–2–0	2–2	none	none
	♀	2–2–2–0	2–2	none	none
II	♂	1–1–0	2–2	none	none
	♀	1–1–0	2–2 (variation 2–1r)	none	none
III	♂	none	0–2	0–2–0	
	♀	none	0–2 (variation 2–2 or 1–2)	0–2–0	



Figs. 31–33. *Neon minutus* ŽABKA, 1985.—31, Tibial apophysis of male palp; 32, female genitalia, ventral view; 33, same, dorsal view. (Scales: 0.1 mm.)

Distribution. Japan (Honshu, Kyushu); Viet-nam.

Remarks. *Neon minutus* resembles *Neon rayi* SIMON, 1895, but can be distinguished from the latter by the structure of copulatory organ, especially by the shape of tibial apophysis of male palp (Fig. 31) (SIMON, 1937; HEIMER & NENTWIG, 1990).

Neon ningyo sp. nov.

(Figs. 34–44, 46)

Type series. Holotype: ♂, Ningyō-tōge, Kamisaibara, Tomata-gun, Okayama Pref., Japan, 6–VI–1992, K. NOJIMA leg. (NSMT–Ar 3221). Allotype: ♀, same data as for the holotype (NSMT–Ar 3222). Paratypes: 1♂, Takafuku, Kawahara-machi, Yazu-gun, Tottori Pref., 7–V–1994, K. NOJIMA leg. (NSMT–Ar 3223); 2♀, Oku-machi, Oku-gun, Okayama Pref., 27–VI–1993, K. NOJIMA leg. (NSMT–Ar 3224).

Description. Measurement of holotype and allotype (in mm) [mean, ♂ N=2, ♀ N=3]. Body length ♂ 1.61 [1.59], ♀ 1.70 [1.98]; prosoma length ♂ 0.80 [0.79], ♀ 0.80 [0.83], width ♂ 0.62 [0.61], ♀ 0.62 [0.67], height ♂ 0.49 [0.44], ♀ 0.40 [0.43]; opisthosoma length ♂ 0.88 [0.83], ♀ 0.93 [1.07], width ♂ 0.57 [0.56], ♀ 0.69 [0.78].

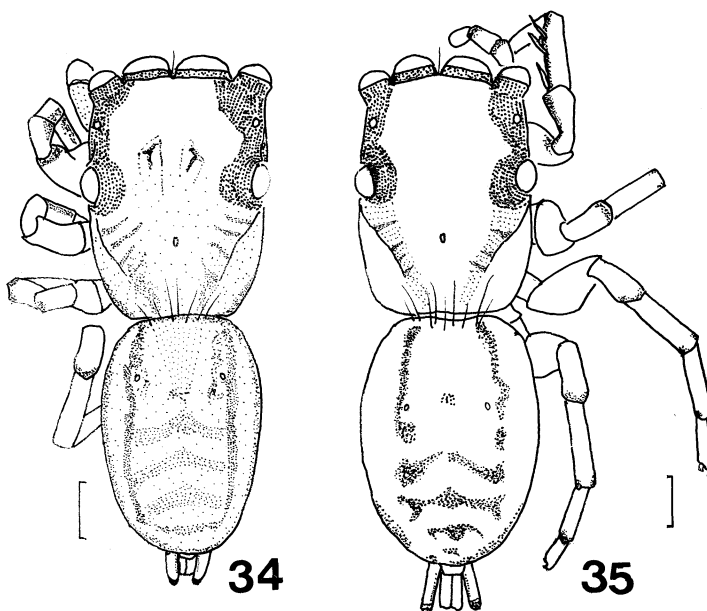
Eye fields: ALE–ALE ♂ 0.61 [0.58], ♀ 0.58 [0.64], PLE–PLE ♂ 0.67 [0.63], ♀ 0.64 [0.66], ALE–PLE ♂ 0.46 [0.46], ♀ 0.46 [0.51], ALE–PME ♂ 0.24 [0.23], ♀ 0.20 [0.23], AME diameter ♂ 0.20 [0.19], ♀ 0.19 [0.21]; ratio ALE/AME ♂ 0.56 [0.58], ♀ 0.60 [0.58], ALE/PLE ♂ 0.88 [0.94], ♀ 1.00 [1.02], PME/PLE ♂ 0.26 [0.27], ♀ 0.24 [0.28].

Legs. Length of legs of the holotype ♂ and allotype ♀ as shown in Table 9. Spiniformation of legs of the same specimens as shown in Table 10.

Male palp (Figs. 36–41). Embolus widely spiraled at base and coiled at apex. Black conductor present.

Female genitalia (Figs. 42–44). Epigynum consisting of two round big white atria (Fig. 42). Spermatheca with asymmetrical small canals.

Coloration and markings (Figs. 34–35, 46). Male: Prosoma yellowish white, surroundings of eyes black with white hairs, thoracic part with sparsely black hairs. Sternum white, labium, maxillae and chelicerae brownish white with white margins respectively. Opisthosomal dorsum whitish brown with brown longitudinal stripes and a few brown indistinct chevrons, so several anterior black setae, and covered



Figs. 34–35. *Neon ningyo* sp. nov.——34, Male, dorsal view; 35, female, dorsal view.
(Scales: 0.2 mm.)

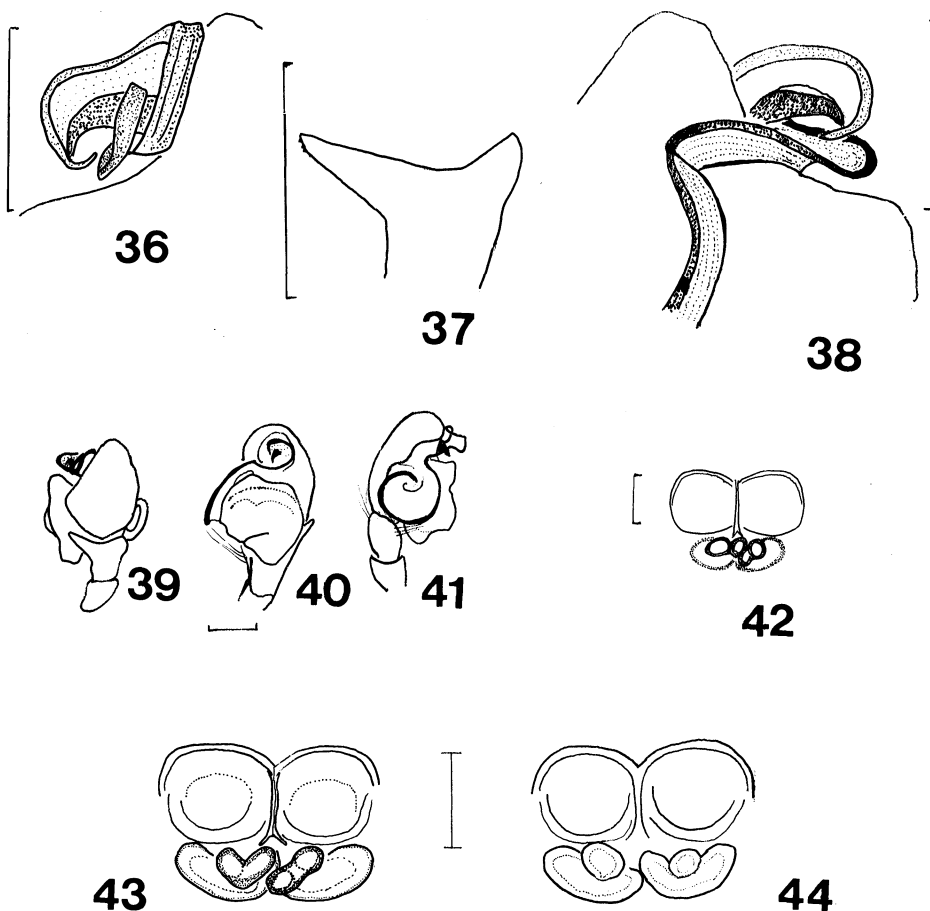
Table 9. Measurement of leg segments of *Neon ningyo* sp. nov. (in mm; ♂/♀).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	0.45/0.40	0.24/0.22	0.40/0.30	0.21/0.21	0.19/0.18	1.49/1.31
II	0.21/0.32	0.18/0.16	0.28/0.24	0.18/0.14	0.21/0.21	1.06/1.07
III	0.40/0.40	0.16/0.21	0.21/0.24	0.22/0.21	0.21/0.24	1.20/1.30
IV	0.48/0.45	0.19/0.21	0.34/0.32	0.29/0.29	0.24/0.24	1.54/1.51

Table 10. Spiniformation of legs of *Neon ningyo* sp. nov. (r=retrolateral, p=prolateral, none=no spine). [No spine on other segments.]

Leg		Tibia	Metatarsus ventral	Tibia	Metatarsus dorsolateral
I	♂	2-2-2-0	2-2	none	none
	♀	2-2-2-0	2-2	none	none
II	♂	none	0-1p	none	none
	♀	1r-1r-0	2-2	none	none
III	♂	none	0-2	none	0-1p
	♀	none	0-2	none	none

with few hairs. Venter of opisthosoma white with short hairs. Legs I: Distal end and prolateral surface of femora, patellae, tibiae and metatarsi black, remaining parts



Figs. 36-44. *Neon ningyo* sp. nov.—36, Embolus and conductor of male palp, dorsal view; 37, same, tibial apophysis; 38, same, embolus and conductor, prolateral view; 39, male palp, dorsal view; 40, same, ventral view; 41, same, prolateral view; 42, epigynum; 43, female genitalia, ventral view; 44, same, dorsal view. (Scales: 0.1 mm.)

white. Legs II-IV: white with distal black ends except for tarsi, tarsi white. Prosoma, legs and opisthosomal dorsum sheeny.

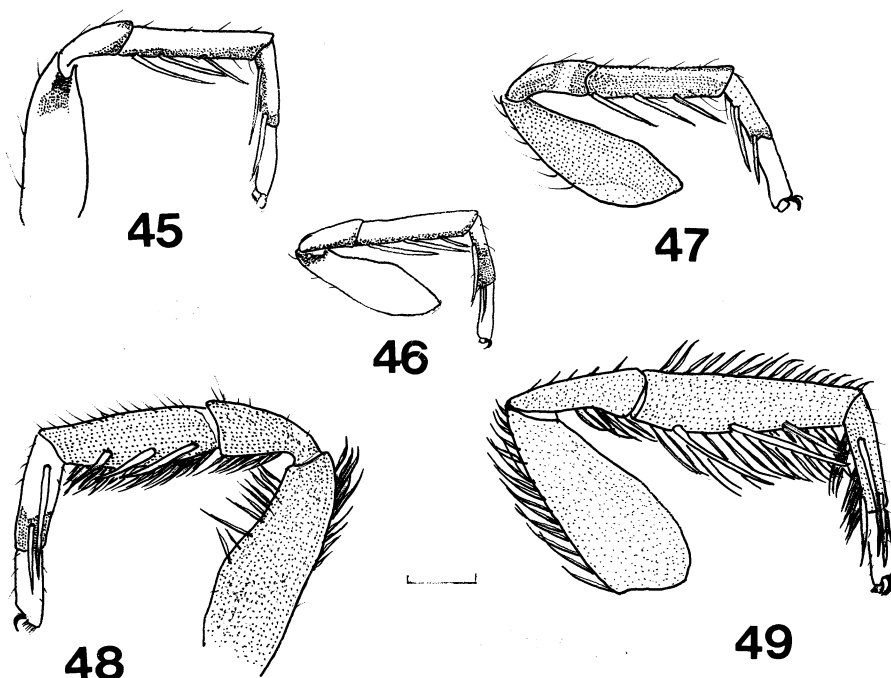
Female: Prosoma white with brown hairs, surroundings of eyes black with white hairs. Sternum, labium, maxillae and chelicerae white. Opisthosomal dorsum white with black spots, with many anterior black setae, and covered with black hairs. Venter of opisthosoma white with short hairs. Legs same as in male. Thoracic part of prosoma slightly sheeny.

Distribution. Japan (known only from Okayama Pref. and Tottori Pref.).

Remarks. In the basic construction of copulatory organ, *Neon ningyo* has close resemblance to *Neon pixii* GERTSCH et IVIE, 1955, from North America. But, the former is distinguished from the latter by the shape of spiral embolus, the presence of conductor of the male palp, the colour pattern of the legs and the shape of

Table 11. Comparison between the males of *Neon* spp. from Japan.

Species	<i>N. reticulatus</i>	<i>N. kiyotoi</i>	<i>N. nojimai</i>	<i>N. minutus</i>	<i>N. ningyo</i>
Colour of prosoma	dark brown	blackish brown	brown	whitish grey	pale brown
Colour of opisthosoma	brown	yellow	yellow	whitish grey	pale brown
Colour of the leg I	black	black	black	whitish grey	white
Setae and hairs of the tibia of leg I	sparse	dense on venter	dense on dorsum and venter	poor	poor

Figs. 45–49. Male first legs of *Neon* spp., prolateral view.—45, *N. minutus*; 46, *N. ningyo*; 47, *N. reticulatus*; 48, *N. kiyotoi*; 49, *N. nojimai*. (Scale: 0.2 mm.)

seminal ducts of the female (GERTSCH & IVIE, 1955). In the female palp, distal ends and prolateral surface of femora, patellae and tibiae are black (allotype) or whole tibia and cymbium are black (paratypes).

Etymology. The specific name refers to the type locality, Ningyô-tôge, Okayama Pref., used in apposition. The meaning of the Japanese word “ningyô” is “a doll.”

Acknowledgements

I wish to express my hearty thanks to Dr. Hirotsugu ONO, National Science Museum (Nat. Hist.), Tokyo, for his constant guidance and for critically reading the manuscript of this paper, and to Mr. Akio TANIKAWA, Kanagawa, for his valuable

guidance and for offering references and specimens, and to Mr. Kiyoto OGATA, Aichi, Dr. Chiyoko OKUMA, Fukuoka, Mr. Ken-ichi KUMADA, Mie, Mr. Yoh IHARA, Hiroshima, Mr. Ko-ichi NOJIMA, Okayama, Dr. Nobuo TSURUSAKI, Tottori, Mr. Tatsuo ISHIHARA, Kanagawa, and Mr. Noboru TAKAHASHI, Kanagawa, for offering or loaning the specimens and the references used in this paper.

摘 要

日本産ハエトリグモ科のネオンハエトリグモ属に次の5種を認めた。 *Neon reticulatus* (BLACKWALL, 1853) ネオンハエトリ, *Neon kiyotoi* sp. nov. キョトネオンハエトリ (新称), *Neon nojimai* sp. nov. ノジマネオンハエトリ (新称), *Neon minutus* ŽABKA, 1985 コガタネオンハエトリ (新称), *Neon ningyo* sp. nov. ニンギョウネオンハエトリ (新称)。これらはそれぞれ生殖器の構造や雄の第I脚によって識別できる。

References

- BLACKWALL, J., 1853. A catalogue of British spiders. *Ann. Mag. nat. Hist.* (2)11: 113–120.
 ——— 1861. A History of the Spiders of Great Britain and Ireland, Part 1. 173 pp.+pl. 12. Ray Society, London.
 BRIGNOLI, P. M., 1983. A Catalogue of the Araneae Described between 1940 and 1981. 755 pp. Manchester Univ. Press, Manchester.
 BRYANT, E. B., 1940. Cuban spiders in the Museum of Comparative Zoology. *Bull. Mus. comp. Zool. Harv.*, 86: 247–554.
 CAPORACCO, L. D., 1948. Arachnida of British Guiana collected in 1931 and 1936 by Professors BECCARI and ROMITI. *Proc. zool. Soc. Lond.*, 118: 607–747.
 CHIKUNI, Y., 1989. Pictorial Encyclopedia of Spiders in Japan. 308 pp. Kaisei-sha, Tokyo. (In Japanese.)
 DENIS, J., 1937. On a collection of spiders from Algeria. *Proc. zool. Soc. Lond.*, 1936: 1027–1060, pls. 1–6.
 GERTSCH, W. J., & W. IVIE, 1955. The spider genus *Neon* in North America. *Amer. Mus. Novitates*, (1743): 1–17.
 LOCKET, G. H., & A. F. MILLIDGE, 1954. British spiders, Vol. 1. x+310 pp. Ray Society, London.
 HEIMER, S., & W. NENTWIG, 1990. Spinnen Mitteleuropas. 543 pp. Paul Parey. Berlin and Hamburg.
 JONES, D., 1983. The Country Life Guide to Spiders of Britain and Northern Europe. 320 pp. Country Life Books. Feltham.
 PLATNICK, N. I., 1989. Advances in Spider Taxonomy, 1981–1987. 673 pp. Manchester University Press, Manchester and New York.
 ROBERTS, M. J., 1985. The Spiders of Great Britain and Ireland, Vol. I. 229 pp. Harley Books, Essex.
 ROEWER, C. F., 1954. Katalog der Araneae von 1758 bis 1940. Bd. 2. 1751 pp. Natura, Bremen.
 SHINKAI, E., & S. TAKANO, 1984. A Field Guide to the Spider of Japan. 206 pp. Tokai Univ. Press, Tokyo. (In Japanese.)
 SIMON, E., 1937. Les Arachnids de France, Tome 6(5), pp. 979–1298, figs. 1502–2028. Paris.
 TULLGREN, A., 1945. Svensk Spindelfauna. 3 Egentliga spindlar. Araneae. Fam. 5–7. Clubionidae, Zodariidae and Gnaphosidae. 132 pp. Stockholm.
 YAGINUMA, T., 1985. Spiders of Japan in Colour (n. ed.). 305 pp., 64 pls. Hoikusha, Osaka. (In Japanese.)
 ŽABKA, M., 1985. Systematic and zoogeographic study on the family Salticidae (Araneae) from Viet-Nam. *Ann. zool. Warsz.*, 39: 197–485.